

What is claimed is:

1. A fiber optic communication system, comprising:

an optical signal source adapted to produce a frequency modulated signal; and

a filter adapted to receive the frequency modulated signal and output a substantially amplitude modulated signal where the spectral profile of the filter is substantially similar to the gaussian profile near a transmission peak having a low frequency side and a high frequency side.
2. The system according to claim 1, where the filter has a substantially negative dispersion on the low frequency side of the transmission peak and a substantially positive dispersion on the high frequency side of the transmission peak.
3. The system according to claim 1, where the quadratic coefficient ranges from about -0.05 dB/GHz^2 to about -0.25 dB/GHz^2 .
4. The system according to claim 1, where the filter has a logarithmic transmission versus frequency with an average slope of about 1 to about 2 dB/GHz and a slope at an operating point of less than about 0.5 dB/GHz.
5. The system according to claim 1, where the filter has a logarithmic transmission versus frequency with an average slope of about 1 to about 2 dB/GHz and a bandwidth of greater than about 1.2 times the bit rate of operation in GHz.
6. The system according to claim 1, where the dispersion on either side of the transmission peak of the filter is substantially constant over a range of frequencies.
7. The system according to claim 1, where the filter is a coupled multicavity (CMC) filter.
8. The system according to claim 1, where the CMC filter is formed from alternating high and low refractive index mirrors.
9. The system according to claim 1, where the filter is a periodic filter.

10. The system according to claim 9, where the period is an integer multiple of 25 GHz.
11. A fiber optic communication system, comprising:

an optical signal source adapted to produce a frequency modulated signal; and

a filter having a logarithmic transmission versus frequency with an average slope of about 1 to about 2 dB/GHz and a slope at an operating point of less than about 0.5 dB/GHz and adapted to receive the frequency modulated signal and output a substantially amplitude modulated signal.
12. The system according to claim 11, where the filter is a coupled multicavity (CMC) filter.
13. The system according to claim 11, where the CMC filter is formed from alternating high and low refractive index mirrors.
14. The system according to claim 11, where the filter is a periodic filter.
15. The system according to claim 14, where the period is an integer multiple of 25 GHz.
16. A fiber optic communication system, comprising:

an optical signal source adapted to produce a frequency modulated signal; and

a filter having a logarithmic transmission versus frequency with an average slope of about 1 to about 2 dB/GHz and a bandwidth of greater than about 1.2 times the bit rate of operation in GHz and adapted to receive the frequency modulated signal and output a substantially amplitude modulated signal.
17. The system according to claim 16, where the filter is a coupled multicavity (CMC) filter.

18. The system according to claim 16, where the CMC filter is formed from alternating high and low refractive index mirrors.
19. The system according to claim 16, where the filter is a periodic filter.
20. The system according to claim 19, where the period is an integer multiple of 25 GHz.
21. A fiber optic communication system, comprising:
an optical signal source adapted to produce a frequency modulated signal; and
a filter adapted to receive the frequency modulated signal and output a substantially amplitude modulated signal where the dispersion on either side of a transmission peak of the filter is substantially constant over a range of frequencies.
22. The system according to claim 21, where the filter has a substantially negative dispersion on the low frequency side of the transmission peak and a substantially positive dispersion on the high frequency side of the transmission peak.
23. The system according to claim 21, where the filter is a coupled multicavity (CMC) filter.
24. The system according to claim 21, where the CMC filter is formed from alternating high and low refractive index mirrors.
25. The system according to claim 21, where the filter is a periodic filter.
26. The system according to claim 25, where the period is an integer multiple of 25 GHz.
27. A filter having a substantially quadratic coefficient of logarithmic transmission with a transmission peak having a low frequency side and a high frequency side where on the low frequency side is a substantially negative dispersion and on the high frequency side is a substantially positive dispersion and the dispersion on either side of the transmission peak is substantially constant over a range of frequencies.

28. The filter according to claim 27, where the quadratic coefficient ranges from about -0.05 dB/GHz^2 to about -0.25 dB/GHz^2 .

29. The filter according to claim 27, where the logarithmic transmission versus frequency has an average slope of about 1 to about 2 dB/GHz and a slope at an operating point is less than about 0.5 dB/GHz.

30. The filter according to claim 27, where the logarithmic transmission versus frequency has an average slope of about 1 to about 2 dB/GHz and a bandwidth is greater than about 1.2 times the bit rate of operation in GHz.

31. A fiber optic communication system, comprising:

an optical signal source adapted to produce a frequency modulated signal; and

a periodic filter adapted to receive the frequency modulated signal and output a substantially amplitude modulated signal with substantially negative dispersion on the low frequency wavelength side of its transmission peaks and substantially positive dispersion on the high frequency side of the transmission peaks.

32. The system according to claim 31, where the quadratic coefficient ranges from about -0.05 dB/GHz^2 to about -0.25 dB/GHz^2 .

33. The system according to claim 31, where the filter has a logarithmic transmission versus frequency with an average slope of about 1 to about 2 dB/GHz and a slope at an operating point of less than about 0.5 dB/GHz.

34. The system according to claim 31, where the filter has a logarithmic transmission versus frequency with an average slope of about 1 to about 2 dB/GHz and a bandwidth of greater than about 1.2 times the bit rate of operation in GHz.

35. The system according to claim 31, where the filter is a multicavity periodic filter where the cavities are thick films.

36. The system according to claim 35, where the cavity thicknesses are chosen to produce a free spectral range about equal to an integer multiple of 25 GHz.

37. A method of forming a filter where the spectral profile of the filter is substantially similar to the gaussian profile near a transmission peak having a low frequency side and a high frequency side, the method comprising:

providing a flat top filter;

passing an optical beam through the flat top filter; and

tuning the angle of incidence of the optical beam to a value greater than 0 degrees to obtain a desired profile.

38. The method according to claim 37, where the angle is between about 1 and about 3 degrees.

39. The method according to claim 37, where in the step of tuning the angle of incident leads to smoothing of the sharp features in the filter profile.

40. The method according to claim 37 where the filter is periodic.

41. The method according to claim 40 where the period is about an integer multiple of 25 GHz.

42. The method according to claim 37 where the filter is a coupled multicavity bandpass filter.

43. A method of forming a filter having a substantially negative dispersion on the low frequency side of a transmission peak and a substantially positive dispersion on the high frequency side of the transmission peak, and the dispersion on either side of the transmission peak being substantially constant over a range of frequencies, the method comprising:

providing a flat top filter;

passing an optical beam through the flat top filter; and

tuning the divergence angle of the optical beam to a value greater than 0 degrees to obtain a desired profile.

44. The method according to claim 43, where the angle is between about 0.1 and about 1 degrees.

45. The method according to claim 43, where in the step of tuning the divergence angle leads to smoothing of the sharp features in the filter profile.

46. The method according to claim 43 where the filter is periodic.

47. The method according to claim 46 where the period is about an integer multiple of 25 GHz.

48. The method according to claim 43 where the filter is a coupled multicavity bandpass filter.

49. A method for minimizing the occurrence distortion due to overshooting or undershooting of the intensity pattern depending on the relative spectral alignment of the laser output, the method comprising:

modulating an optical signal to a partially frequency modulated signal;

converting the partially frequency modulated signal to a substantially amplitude modulated signal;

passing the substantially amplitude modulated signal to a flat top filter; and

tuning the divergence angle of the substantially amplitude modulated signal to a value greater than 0 degrees to obtain a desired profile.

50. The method according to claim 49, where the angle is between about 0.1 and about 1 degrees.

51. The method according to claim 49, where in the step of tuning the divergence angle leads to smoothing of the sharp features in the filter profile.

52. The method according to claim 49 where the filter is periodic.
53. The method according to claim 52 where the period is about an integer multiple of 25 GHz.